

REMARKS/ARGUMENTS

Claims 1-16 and 20-24 are active in the case. Reconsideration is respectfully requested.

The present invention relates to a backprojection and/or projection screen.

Claim Objection

The objection to Claims 2 is believed obviated by the amendment made to the claim which simplifies the language thereof by simply stating that the screen has a resolution ranging from 5×10^3 and 1×10^5 dpi as disclosed on page 5, lines 8-21 of the specification. Entry of the amendment to the claim is respectfully requested.

Claim Amendments

Claim 1 has been amended so as to identify front and rear faces of the screen and to specify that the scattering layer is prepared by dispersing semitransparent mineral particles having an index of refraction greater than 1.7 in a binder having an index of refraction less than 1.6, as disclosed on page 6, lines 12-16 of the specification. The binder is also identified as a mineral binder as supported by the text at page 6, lines 18-21. Other, minor changes have been made to the language of the claim in order to improve the readability of the claims. None of the amendments are believed to have introduced new matter into the case.

With respect to the amendment made to claim 2, applicants refer to the comments above in the objection to claim 2. The amendment made is believed to simplify the claim. The amendment is not believed to have introduced new matter into the case. Entry of the amendments into the record is respectfully requested.

Invention

The present invention is directed to a backprojection and/or projection screen that is formed of at least a first substrate having a scattering layer. The scattering layer is prepared by dispersing semitransparent mineral particles having a refractive index greater than 1.7 in a mineral binder having a refractive index of less than 1.6. The scattering layer is fixed to a surface of the substrate which results in a subsurface effect, thereby forming a screen having front and rear faces. The scattering layer provides a viewing angle of less than or equal to 180° on both faces of the scattering layer. The scattering layer effectively scatters light which enables a viewer of the screen to view and discern images at oblique viewing angles. The scattering layer is formed of fine mineral particles that are bound to a surface of a substrate, which is normally transparent, by a mineral binder. The mineral particles can be oxides of silicon, aluminum, zirconium, titanium and cerium, while the binder preferably can be the likes of a potassium silicates, sodium silicates, lithium silicates, and aluminum phosphates. Accordingly, advantages which accrue from the “all” mineral technology of the screen of the invention are that the sensitivity of the product screen to moisture and to UV radiation is very low. Further, the fact that the viewing angle of the screen may be up to 180° limits what is known as the “hot spot” phenomenon, by which is meant that a viewer of a screen can perceive, along the projection axis and through the screen, the light source.

Claim Rejection, 35 USC 103

Claims 1-3, 5 13-15 and 22-24 stand rejected based on 35 USC 103(a) as obvious over Burke, U. S. Patent 6,064,521 in view of Fujisaki et al, U. S. Patent 3,726,583. This ground of rejection is respectfully traversed.

The Burke patent discloses an image projecting screen. Fig 12 of the patent shows a laminate of a light scattering layer and a polarizing layer 309 positioned on a substrate layer 308. The description of the screen in column 16 of the patent states that the scattering layer is

a partially transparent and reflective bead layer, and that the substrate is transparent. A projected image can be observed viewing either face of the screen. However, there is no teaching or suggestion of a scattering layer that contains light scattering particles or beads that have a refractive index that is greater than 1.7 in a binder that has a refractive index that is less than 1.6, in order to provide images on both sides of the screen that have excellent image uniformity. This feature is important in distinguishing the present projection screen over that of Burke. Accordingly, the cited Burke patent does not suggest the claimed screen of the present invention.

The cited Fujisaki et al patent does not overcome the deficiencies of the Burke patent, because it does not disclose a screen that can be viewed from either face, but rather the screen described therein is a reflection screen by which a projected image can be viewed from only one of the faces of the screen.. Moreover, although the patent describes a light scattering layer on a surface of an aluminum substrate, the composition which forms the scattering layer is not described in terms of the particle/binder material of the present claims which maintains a distinction between the refractive indices of the particles and the binder material. Accordingly, the combined patent disclosures do not suggest the invention as claimed.

Claim 22 is directed to the aspect of the invention of a method of viewing images which is dependent on the features of the projection screen defined in Claim 1. As seen above, an important aspect of the screen is that the scattering layer is formed from a composition of particles in a binder medium in which the refractive indices of the particles and the binder are important. Neither of the above discussed patents shows the scattering layer of a projection screen that is formed from particles and binder that have different indices of refraction. Accordingly, the combined patents do not suggest the present method as claimed and withdrawal of the rejection is respectfully requested.

Claim 4 stands rejected based on 35 USC 103(a) as obvious over Burke, U. S. Patent 6,064,521 in view of Fujisaki et al, U. S. Patent 3,726,583 and in view of Yoshida et al, U. S. Patent 6,421,181. This ground of rejection is respectfully traversed.

Claim 4 is directed to a secondary aspect of the invention which is a feature upon which patentability does not depend. Moreover, the patentably distinguishing features of Claim 1 are incorporated into Claim 4 so that the claim is distinguished over the primary references.

Yoshida et al, as previously stated, describes a tinted sheet of a rear projection screen that is comprised of a lenticular lens sheet and a Fresnel lens sheet. Fig 1 of the patent shows such a configuration. However, no such projection screen construction is claimed in the present invention, so that it is clear that the combined references do not suggest the dependent aspect of the invention as set forth in Claim 4. Withdrawal of the rejection is respectfully requested.

Claim 6 stands rejected based on 35 USC 103(a) as obvious over Burke, U. S. Patent 6,064,521 in view of Fujisaki et al, U. S. Patent 3,726,583 and in view of Gehring et al, U. S. Patent Publication 2002/0163711. This ground of rejection is respectfully traversed.

Claim 6 is directed to a secondary aspect of the invention in which the projection screen features the scattering layer in relation to two substrates. However, this again is a feature upon which patentability does not depend. Still further, the patentably distinguishing features of Claim 1 are incorporated into Claim 6 which distinguishes the claim over the primary references.

Moreover, the line of beads described in paragraph [0103] of the Gehring et al patent is not the same thing as the “bead” of present Claim 6 which is a peripheral line of material upon which an applied scattering layer rests. Accordingly, the combined references do not suggest the invention and withdrawal of the rejection is respectfully requested.

Claim 7 stands rejected based on 35 USC 103(a) as obvious over Burke, U. S. Patent 6,064,521 in view of Fujisaki et al, U. S. Patent 3,726,583 in view of Toda et al, U. S. Patent Publication 2006/0033991. This ground of rejection is respectfully traversed.

Claim 7 is directed to a secondary aspect of the invention upon which patentability does not depend. In fact, the primary references, as the Examiner states, do not teach the mutual agglomeration of particles in the light reflective layer. Moreover, applicants contend that the cited Toda et al patent in paragraph [0162] does not teach the agglomeration of particles, but simply states that a binder “buries gaps among particles.” It does not seem to applicants that this statement is tantamount to the agglomeration of particles. Accordingly, Claim 7 is believed to be patentably distinguished over the cited combination of references. Withdrawal of the rejection is respectfully requested.

Claims 8-10 stand rejected based on 35 USC 103(a) as obvious over Burke and Fujisaki in view of Toda et al, U. S. Patent Publication 2006/0033991 and Kaminsky, U. S. Patent 7,046,439. This ground of rejection is respectfully traversed.

Applicants maintain their position as stated with respect to Burke, Fujisaki and Toda et al. In fact, Claims 8-10 fully incorporate the patentable features of Claim 1 therein, and therefore are of themselves patentable over the applied references. The disclosure of the Kaminsky et al patent does not improve upon this situation and accordingly, withdrawal of the rejection is respectfully requested.

Claims 11 and 12 stand rejected based on 35 USC 103(a) as obvious over Burke and Fujisaki in view of Toda et al and Kaminsky, and further in view of Etori et al, U. S. Patent Publication 2001/0005282. This ground of rejection is respectfully traversed.

Claims 11 and 12 are directed to a secondary aspect of the invention which is the use of glass frit or melting agent as a binder. However, as seen above, these claims depend

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ultimately upon the patentable features of Claim 1, and therefore are believed to be patentable. Withdrawal of the rejection is respectfully requested.

Claims 16 and 20 stand rejected based on 35 USC 103(a) as obvious over Burke and Fujisaki in view of Iwata et al, U. S. Patent 6,327,088. This ground of rejection is respectfully traversed.

The subject matter of Claims 16 and 20 are of secondary interest and are not features of the invention upon which patentability depends. On the other hand, these claims are dependent upon Claim 1 which is distinguished over the prior art of record. Withdrawal of the rejection is respectfully requested.


It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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